DOCUMENT RESUME

ED 183 118 HE 012 382

AUTHOR Blum, Mark E.; Spangehl, Stephen D.
TITLE Identifying Skills and Developing Curricula in Academic Research: Rationale for a Competency-Oriented Curricula.
PUB DATE 23 Mar 79
NOTE 27p.; Paper presented at an Annual Special Programs Conference of the Southeastern Association of Educational Opportunity Program Personnel (7th, Miami Beach, FL, March 23, 1979); an appended worksheet may not reproduce well

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Basic Skills; *College Curriculum; *Educational Assessment; *Educational Objectives; Educational Research; Educational Theories; Evaluation Criteria; General Education; Higher Education; *Liberal Arts; Models; *Remedial Programs
IDENTIFIERS *Competency Based Education; Introductory Courses; *University of Louisville KY

ABSTRACT

Progress made in the University College of the University of Louisville in a competency-oriented general education program, with a supporting remedial skills component, is reported. The theoretical bases of competency-based developmental education in the liberal arts and the Louisville schema of basic or remedial skills that underly the higher academic competencies are presented. The competency-oriented structure for general education and remedial support projected over the next three years is also included. Competencies are listed for introductory courses in humanities, social sciences, and academic library research. The competencies were developed over a two-stage process of rational analysis and empirical trial. The evaluation schema of the university for assessing the competencies of academic inquiry is described. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED183118

IDENTIFYING SKILLS AND DEVELOPING CURRICULA IN ACADEMIC RESEARCH: RATIONALE FOR A COMPETENCY-ORIENTED CURRICULA

Mark E. Blum and Stephen D. Spangehl
University College, University of Louisville

A Paper Presented at the Seventh Annual Special Programs Conference, Southeastern Association of Educational Opportunity Program Personnel, March 23, 1979, Miami Beach, Florida

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Stephen Spangehl
Mark E. Blum

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

HE 012 382

Identifying Skills and Developing Curricula in Academic Research: Rationale for a Competency-Oriented Curricula

Competency-oriented education in the liberal arts college is a recent response of undergraduate educators to meet the modern demand that the goals, methods, and outcomes of any educational experience be explicit and assessable.

Transforming traditional courses in academic ideas and inquiry in the humanities, natural sciences, and social sciences into explicit competency-based courses is a two-stage process. The first stage is a rational analysis of what is taught in the major divisions of knowledge at the general education and advanced undergraduate levels, and articulating this content into a schema of competency objectives and measures which can guide course design. The second stage is to teach such a course, and to see how the rationally posited competencies fare in the reality of practice: do they indeed exist? are they assessable? and, what competencies have we forgotten in the design of the course?

We call this a competency-oriented approach in order to state the reality of the long range project that faces a competency-based undergraduate education that is totally based on measurable competencies is equivalent to the construction of a new educational paradigm. It will necessitate all the trials that Thomas Kuhn estimates paradigmatic development of a science requires. This is especially true in regard to the specification of the explicit skills of academic inquiry, for Kuhn in discussing the way a scientist operates, stresses the unconsciousness of the research to his own methods. (Thomas Kuhn, 1970, p. 47.)

Designing courses in the humanities, social sciences, and natural sciences that instruct the ideas and methods of inquiry is a young, almost infant pedagogy. We must discover the competencies, devise methods of assessing competency-development, and realize that many competencies will yet exist that have not been specified. Calling our attempt at this reconstruction of an undergraduate education "competency-oriented" allows for exploration, and does not totally intimidate the venturesome professor from trying. He sees that he has room for the specification and assessment of some competencies without feeling committed to a concrete program that in actuality must grow gradually through the two-stage process of rational design and empirical trial.

There is an educational history and an established platform of ideas and methods in competency education in the United States. Most of the research and development in the past ten years has occurred in secondary education. (Oregon, 1973.)

However, liberal arts colleges such as Bowling Green University (Woditsch, 1977; Schlesinger, 1977), Alverno College (Alverno College Faculty, 1977), and the University College of the University of Louisville (Blum and Spangehl, 1978) are among a growing number of post secondary institutions that have embarked on the long journey to a competency-based paradigm.

Our discussion in this paper will concentrate on the actual progress we have made in the University College of the University of Louisville in a competency-oriented general education (with a supporting remedial skills component). We will:

I - Present the theoretical bases of a competency-based developmental education in the liberal arts, which guide our efforts.

II - Present our schema of basic (remedial) skills which underly the higher academic competencies.

III - Present the competency-oriented structure for general education and remedial support projected over the next three years of our development.

IV - Present a list of competencies in our introductory courses in humanities, social sciences, and academic library research which have been developed over the two-stage process of rational analysis and empirical trial.

V - Present our evaluation schema for assessing the competencies of academic inquiry.

I. THEORETICAL BASES OF COMPETENCY-BASED DEVELOPMENTAL EDUCATION IN THE LIBERAL ARTS

It is no small task to restructure major domains of knowledge, and the attendant disciplines, according to the competency objectives (performance ones at that) such as Alverno College has isolated (communication, analysis, problem solving, value judgments, social interaction, man-environment relationships, knowledge of the world, and esthetics). However, our experience at the Developmental Education Center at the University of Louisville has proven that such progress is possible. Working with the conceptual guides articulated by Gary A. Woditsch in his Developing Generic Skills: A Model for Competency-Based General Education. (CUE Project. Occasional Paper Series No. 3, published by CUE Project. Bowling Green, Ohio: Bowling Green State University, May, 1977), we have determined "generic" skills of knowledge acquisition, knowledge production, and knowledge utilization which underlie the undergraduate academic (and graduate academic) conduct of inquiry and invention. Then, we have studied researchers in the social sciences, humanities, and natural sciences to determine how particular "phenotypes," i.e., actual examples of these generic skills are wielded in a particular discipline within research on individual problems. We began this study two years ago influenced by Abraham Kaplan's Conduct of Inquiry, and the competency-based, developmental work of elementary and secondary school curriculum development laboratories (such as Research For Better Schools in Philadelphia) who have created competency-based research units in social and natural sciences for the past decade.

Woditsch's recent work on generic skills is very important for the logical pursuit of identifying the competencies that take place in the conduct on inquiry. It is the basis for a phenomenological study of researchers in action. One must carefully value Woditsch's contribution to competency-based learning, for determining a competency in higher education is an activity few researchers themselves have self-consciousness about. Thus, phenomenological study of practice must and can reveal what is expected of students, and with consciousness and intention, can be taught to them more thoroughly and effectively than the traditional mode of simply "expecting" someone to produce.

The "generic" skills areas of knowledge acquisition, production, and utilization which we have determined can be understood according to the broad procedural areas they encompass. The acquisition of knowledge in the social sciences, humanities, or natural sciences includes procedures which are common to each of these major divisions of human knowledge. Acquiring knowledge involves the methods of inquiry developed by the human species over its history of experience in the world. The human make-up of abilities and faculties has determined the essential elements of the acquisition stage of knowledge development; man uses language to frame questions, man uses his senses and motility in the conduct of inquiry to establish facts, man has a memory and other storehouses of information which provide a background

of knowledge acquisition which are part of every domain of science. The list of acquisition methods on the following page can be seen as belonging to any adequate education in the natural sciences, humanities, or social sciences. These methods of knowledge acquisition are the backbone of a developmental education within the discipline in which they are practiced.

The production of knowledge in the major scientific fields, which includes humanities, involves again, those methods which mankind has developed to suit his organic makeup and the conditions of life on earth. Many must be able to use an individual set of cognitive and physical tools in any personal search for the solution to a problem and in the establishment of a solution to a problem. Man must learn to translate information about things which he has learned from others into viable tools and procedures which enable him to conduct his search in his immediate surroundings. Moreover, whatever he discovers is evidence or fact only to him until he is able to communicate his results to another in a form that is not only convincing, but capable of being demonstrated yet again to a third party. Objectivity, replicability, cultural utility all depend upon an individual learning how to package and communicate the facts established in a personal search. The truths involved in the human act of producing knowledge not known before are part of the human condition. The imperatives involved in knowledge production, and the methods individuals have developed in culture to establish knowledge and production, as in knowledge acquisition, rely on the nature of the human mind, the human senses, and the contingencies of human motility and life in the world. The list of production methods below may not exhaust the particular methods in any discipline or field, but they suggest the many considerations developmental education brings to the human conduct of knowledge production.

The utilization of knowledge in the social sciences, humanities, and natural sciences varies according to the cultural state of the world in the given epoch. Some fields of knowledge go about making discoveries and are not called upon by the social world to contribute with their knowledge to effecting improvement in the society. I suspect that if we talk about individual investigators in any field, we will see that every person wants to make use of his discoveries, and that this has been true in every epoch. Some men never learn how to implement what they discover in a cultural application that works. The survey below of utilization methods by which knowledge can be implemented for cultural gain is a list of methods which are relevant to the sciences in every discipline. The methods are required, again, because of the nature of the human being and the conditions of life in the world. Certain bases must be touched in any attempt by a science to implement its discoveries in existing cultural systems. Certain skills must be learned by an individual if he would effect his discovery in actual use among the on-going operations of his fellows.

Acquisition

Acquiring existing information:

...learning sources for research in the field
...learning vocabulary of the field
...learning principle investigators within the field
...learning key ideas within the field
...learning the history of ideas, sources for research, and principle investigators in the field
...learning the parameters of the field historically and presently
...learning the forms and styles in which hypotheses, theories, and laws are expressed in the field.

Acquiring the methods for individual search in the field:

...learning the existing perspectives and approaches for developing facts in the field
...learning the forms for articulating problems, hypotheses, theories, and laws appropriate for one's area of research
...learning how to establish a scope of search
...reviewing personal assumptions and search criteria
...learning evaluation methods relevant to search
...learning the methods of data collection, classification, and other organizational modes adequate for actual investigation.

Acquiring the methods of knowledge application and communication (utilization):

...learning how ideas, theories, and laws in the field have been historically used in cultural projects
...learning the current methodological utility of ideas, theories, and laws in the field to present cultural problems
...reviewing the interdisciplinary cooperation of the field with other fields in cultural projects in terms of ideas, methods, and technologies
...isolating tools (methods of inquiry, methods to effect changes, methods to establish purposes) of the discipline which can be used in cultural projects
...learning the customary formats of communication used by the field.

Production

Producing thematic organization for focusing individual search in a field

...learning to identify thematic interests in a field
...learning to articulate problem statements which will guide and facilitate personal search
...learning how to construct hypotheses which may be evaluated

...learning how to select existing methods of inquiry and data collection, and how to plan an augmentation and innovation in the conduct of inquiry and data collection to accomodate personal search problems
...learning the existing criteria in the field for valid and reliable experimentation.

Producing methods appropriate for the conduct of an individual search:

...practicing the psycho-physical steps in the conduct of experimentation
...practicing the application of data collection categories, measures and other criteria in the midst of experimentation
...learning the models in one's field for theory development and the expression of laws
...practicing theory development on the basis of verified hypotheses.

Producing personal methods of knowledge application and communication (utilization):

...practicing the written and oral communication of facts, hypotheses, theories, and laws in one's field
...develop a genre of expression appropriate and effective for communicating one's area of search and discovery
...practicing demonstration to laymen and professionals in various fields
...identifying areas of culture (people, technology, institutional organization) which might benefit from knowledge of the facts or application of the procedures in your discovery
...refining problem statements and applications of your discoveries adequate for solving the problem statements
...developing plans for implementing solutions in the environment that you wish to affect.

<u>Utilization</u>

Acquiring the established methods and history of cultural implementation of the discoveries of the field, and the forms in which knowledge in the field has been communicated:

...survey of the field's history of technologies and its applications
...survey of the individual scientists in the field in terms of their method and style of communicating and demonstrating discoveries.

Producing culturally useful tools and applications based on the discoveries of your search:

...learning to develop tools and applications of experimental discoveries in pilot tests and extensive field tests

...learning the group dynamics and interpersonal skills requisite for adapting personal discoveries to existing systems
...developing the training methods required for schooling others in the use of your tools and knowledge.

Utilizing your discovery in cultural projects and on-going institutions:

...developing a monitoring system for identifying the career of your discovery (took, procedure, conduct) in its use in the project or institution
...developing a modification system for reestablishing the integrity or modifying the integrity of your discovery in its use in the project or institution
...establishing an informational system by which others who use your discovery can inform you of its utility in a language that allows you to refine the existing discovery to meet new problems.

II. BASIC (REMEDIAL) SKILLS UNDERLYING ACADEMIC INQUIRY

Underlying the procedural skills of knowledge acquisition, production, and utilization, are basic mental (and emotional) operations. Remedial treatment which prepares students for academic inquiry is in each of these basic cognitive/affective operations.

Briefly, the basic operations which make up the various higher order procedures discussed above are:

1 - self-concept and motivation
2 - reading skills
3 - quantitative skills
4 - communications skills (written and oral)
5 - basic informational skills (locating information, and the basic, established vocabularies and facts necessary for college level discourse)
6 - interpersonal skills
7 - critical thinking skills
8 - research and study skills (listening, note-taking)

We arrived at these basic operations rationally, with the same inferential-analytic process that led to our establishment of the higher order inquiry procedures of knowledge acquisition, production, and utilization. We then researched individualized, self-paced learning materials that could be directed at these skill areas, and set up a remedial learning laboratory to test out our remedial skill courses empirically. Some new areas for treatment emerged as we engaged in instruction. Not all instruction on the remedial level began with individualized materials. In critical thinking, for example, we began with a team-taught class, and then gradually developed materials in the wake of the class.

Among the additional basic operations that emerged as needful for treatment in a remedial program were the: 1) ability to follow instructions, such as graphic formats on worksheets, alphabetical, chronological, and numerical sequences (all of which can be included

in the broad area of critical thinking within visual and verbal logic units); and, 2) mechanical skill courses, type-writing, and the ability to use computers and audio-visual aids.

Below is the course topic and numbering system we now use when developing remedial courses:

DEC 001-DEC 009	Counselling and Guidance Courses
DEC 010-DEC 029	Reading Courses
DEC 030-DEC 039	Quantitative (mathematics) courses
DEC 040-DEC 049	Mechanical skills courses
DEC 050-DEC 059	Speech, Listening, Group behavior courses
DEC 060-DEC 069	Writing courses
DEC 070-DEC 079	Basic information courses
DEC 080-DEC 089	Critical thinking courses
DEC 090-DEC 099	Research skills courses

These skill areas can be seen as part of a family continuum of skills which have their higher order equivalents at the general education level.

III. COMPETENCY-ORIENTED COURSE STRUCTURE FOR GENERAL EDUCATION AND REMEDIAL SUPPORT PROJECTED OVER THE NEXT THREE YEARS

Course development begins with a rational analysis of those skills (i.e. knowledge procedures) which are vital to student survival. When planning general education courses in the humanities, social sciences, and natural sciences, for example, we first seek to identify the major competency outcomes of the first two years of a liberal arts education; we then develop courses that will fulfill these expectations.

The broad goals of a competency-oriented, general education curricula are, in our view, comprehended in the following six competency objectives:

1. Acquaintance with the purposes, methods, and nature of evidence in each of the three major divisions of knowledge (i.e., the humanities, the social sciences, and the natural sciences).

2. Ability to comprehend and to use the various vocabularies of the specialized disciplines within the major divisions of knowledge.

3. Mastery of critical thinking skills which enable comprehension, analysis, and extrapolation of verbal, written, quantitative, and visual information.

4. Acquaintance with the existing sources of information in the major divisions of knowledge, and the ability to use these sources.

5. Knowledge of the history, major findings, current state, and directions of inquiry in each of the major fields.

6. Ability to conduct independent inquiry, and to communicate findings effectively in oral, written, and visual forms.

Given these objectives, we then consider the several types of courses that will provide an economical, balanced experience in the three major divisions of knowledge. Below is a list of general education and remedial support courses that we will seek to introduce into our curricula at University College in the next three years. The plan beyond this time will begin to incorporate fine arts courses; in the three year period, we have limited ourselves to academic research in the humanities, social sciences, and natural sciences. These constraints are due to faculty size and the need to prioritize our efforts because of uncertain funding.

OBJECTIVES FOR DEVELOPMENT AND OPERATION OF COURSES, 1979-1982

D=DEVELOPMENT
O=OPERATION

COURSES		1979-80	1980-81	1981-82
LBST 101	Ideas & Research: Creative Expression	D	O	O
*LBST 102	Ideas & Research: Behavioral Studies	O	O	O
LBST 103	Ideas & Research: Scientific Studies	D	O	O
*LBST 104	Case Studies in Creative Expression	O	O	O
*LBST 105	Case Studies in Behavior and Institutions	O	O	O
LBST 106	Case Studies in Science and Technology		D	O
*LBST 110	Academic Library Research	O	O	O
LBST 201	Guided Reading, Reporting: Creative Expression		D	O
LBST 202	Guided Reading, Reporting: Behavioral Studies		D	O
LBST 203	Guided Reading, Reporting: Scientific Studies		D	O
LBST 250	Independent Reading in Interdisciplinary Areas			D
LBST 299	Independent Projects in Interdisciplinary Areas			D

*Denotes courses developed and in operation before 1979-80 academic year

OBJECTIVES FOR DEVELOPMENT AND OPERATION OF COURSE, 1979-1982

D=DEVELOPMENT
O=OPERATION

COURSES		1979-80	1980-81	1981-82
DEC 001	Orientation	O	O	O
DEC 050	Presentation Skills		D	O
*DEC 059	Listening and Concentration	O	O	O
*DEC 060	Spelling I	O	O	O
*DEC 061	Spelling II	O	O	O
*DEC 065	Standard Usage	O	O	O
DEC 068	The Mechanics of Writing	D	O	O
DEC 069	Basic Organization in Writing		D	O
*DEC 073	Vocabulary Development I	O	O	O
*DEC 074	Vocabulary Development II	O	O	O
DEC 075	Basic Facts in World Events	D	O	O
*DEC 080	Critical Thinking I	O	O	O
DEC 081	Critical Thinking II	D	O	O
DEC 090	Research Skills: Taking Notes		D	O
DEC 091	Research Skills: Questions			D

*Denotes courses developed and in operation before 1979-80 academic year

IV. COMPETENCIES IN THE ACQUISITION AND PRODUCTION OF KNOWLEDGE FOR TWO GENERAL EDUCATION COURSES; INTRODUCTION TO THE SOCIAL SCIENCES AND HUMANITIES, AND ACADEMIC LIBRARY RESEARCH

The competencies which are treated in Introduction to the Social Sciences and Humanities and Academic Library Research have been determined through four semesters of actual teaching. The rational analysis of competencies to be taught was more limited than the many competencies that emerged through student work in the courses.

All of these competencies are assessable, as will be demonstrated in Section V which treats our assessment system.

We refer each of the specific (or phenotypic) skills exercised in each course to the generic research skill which it evidences.

The distinction and discussion of generic and phenotypic skills can be best comprehended in Gary Woditsch's presentation of the model for competency-based education (Woditsch, 1977). The process of locating assessable skills in the procedures of academic inquiry can be considered in depth in Blum and Spangehl's discussion of the trichotomy of abilities, skills, and procedures (Blum and Spangehl, 1978).

LBST 101 Ideas and Research in the Social Sciences and Humanities

A course that introduces the student to the value of academic inquiry by engaging him in short research projects in the social sciences and humanities. The student learns the major purposes and methods of inquiry of the social sciences and humanities through case study examples of research, and then develops a personal project in each division of knowledge that allows him to practice the conduct of research.

Acquisition Competencies

Students learn:

1. The fundamental goals of social science and how these complement and contrast the goals of the humanities.
   (Generic competency; learning the existing perspectives and approaches for gathering facts in the field of knowledge.)

2. The kinds and forms of questions that stimulate research in social scientific and humanistic investigation.
   (Generic competency: learning the forms for articulating problems, hypotheses, theories, and laws appropriate for one's area of research.)

3. The discrimination of fact within the social sciences and the humanities, and how each division of knowledge determines evidence to prove propositions.
   (Generic competency: learning the criteria for fact and for evidence in the development of knowledge.)

4. The methods of investigation common to the social sciences, and common to the humanities.
(Generic competency: learning the methods of data collection classification, and other organizational modes by which knowledge is developed in the course of inquiry.)

5. The basic vocabulary which directs the discovery and classification of knowledge in the social sciences and humanities.
(Generic competency: learning vocabulary of a field.)

6. Recognition and simulation of reporting practices that give the results of research in the social sciences and humanities.
(Generic competency: learning the customary formats of communication used in a field of knowledge.)

7. The ways in which knowledge developed by the social sciences and humanities have been utilized in the culture.
(Generic competency: awareness of the field's technologies and applications, as well as the applications of knowledge created by the field in other cultural technologies.)

Production Competencies

Students learn:

1. The articulation of a personally meaningful theme of human experience which can be researched by the methods of the social sciences and humanities for the augmentation of personal knowledge.
(Generic competency: articulating personal assumptions concerning issues of culture.)

2. The formulation of propositions and questions which can guide thorough and efficient research in the social sciences and humanities.
(Generic competency: learning how to construct questions and problem statements which suggest areas of inquiry, types of evidence to be acquired, and the criteria by which the evidence may be evaluated.)

3. To articulate personal assumptions concerning the issue chosen for investigation in order to become aware of biases and belief systems.
(Generic competency: becoming aware of the values and belief systems which form the basic assumptions of any cultural investigation.)

4. The planning of research in a manner that combines the fundamental methods of investigation of social sciences, and, of the humanities, into a coherent and practicable plan (given the question to be answered).

(Generic competency: learning how to select methods of inquiry and data collection, generic to a division of knowledge, which are appropriate in establishing the kind of evidence acceptable as valid in the field (given the question).

5. The practice of inquiry in the social sciences and humanities:

   Social Sciences

   --Practicing the investigatory methods of behavioral observation, survey, performance testing, physical testing, cultural analysis, and statistical analysis in conduct of a research project to test a proposition or answer a question.

   Humanities

   --Practicing the investigatory methods of introspection, comparison, and logic in the construction and conduct of a research project to test a proposition or answer a question. (Generic competency: practicing the psycho-physical steps of inquiry, within the established forms of a division of knowledge, in quasi-experimental settings.)

6. Compilation, analysis, and synthesis of data collected in the social science and humanities projects in forms which allows reader to review the research steps and accomplishments of the inquiry.
   (Generic competency: learning the communication of research results through oral, written, and visual methods of demonstration.)

LBST 110 Academic Library Research

A course that introduces the student to the methods of academic library research by instructing him in the chief information systems available in the college library. The student learns the systems by developing a thorough annotated bibliography on a topic of interest which may be within a discipline or interdisciplinary. The annotation aspect of the project permits instruction of criteria and methods for evaluating sources of information.

Acquisition Competencies

Students learn:

1. How to access information systems and locate printed materials that are pertinent to answering a question in a given field. (Generic competency: learning to use the tools relevant to phases of academic research.)

2. The chief sources of information (bibliographies, dictionaries, texts, etc.) in selected fields within the social sciences, humanities, and natural sciences.
   (Generic competency: learning the sources for research in the field.)

3. The principle contemporary and historical investigators in a selected field through study of biographical dictionaries, state of the art reviews, etc..
(Generic competency: learning the principle investigators within a field in order to gain access to authoritative studies.)

4. The criteria which can demarcate the scope of an academic field, or, a sub-category of an academic field (the breadth and depth criteria, which include the range of certain questions, the history of the field, the special issues of interest in a field, etc.).
(Generic competency: learning the parameters of the field historically and presently.)

5. The criteria for evaluating the quality of information in a text, article, etc. (the background of author, the formulation of purpose, thoroughness of exposition, citation, etc.).
(Generic competency: learning to evaluate the kind and quality of information.)

Production Competencies

Students learn:

1. The articulation of a personally meaningful theme which has been studied by the major divisions of knowledge.
(Generic competencies:
--formulating a clear, researchable question
--familiarity with initial subject sources; subject indexes, bibliographies, encyclopedias.)

2. To develop a set of criteria for setting an adequate scope of research in the compilation of an annotated bibliography.
(Generic competencies:
--learning the parameters of the field(s) historically and presently in which the topic is treated
--learning to evaluate the kind and quality of information.)

3. To conduct research into printed sources in order to compile a 40-item bibliography which gives a reader thorough introduction into a topic.
(Generic competencies:
--accessing and using information retrieval systems
--learning to evaluate the kind and quality of information.)

4. To annotate items of information in a manner that gives the reader guidance in its possible value.
(Generic competencies:
--learning to evaluate the kind and quality of information
--developing a genre of expression appropriate and effective for communicating one's area of search and discovery, according to rules of field.)

V. ASSESSING GOAL-ORIENTED COMPETENCIES: A COMPETENCY-BASED EVALUATION DESIGN.

The attempts to design an evaluation schema for competency development must consider two major facts concerning the nature of skills:

1. Skills, by definition, are learned and imply development.

2. Skills are used within goal-oriented activity.

Placing skill assessment within the locus of these essential characteristics suggests the direction of an evaluation design: a) skills are tracked within the actual projects they seek to accomplish, and each skill's development is determined in the light of its adequacy and accuracy in achieving the goal; repeated exercise of a skill in various projects enable estimation of its development, b) the rationale of a project helps to shed light on the dimension of self-directedness in skill use by an individual; one aspect that makes any act "skilled" is the conscious purpose with which the act is performed; philosophers of action, such as Merleau-Ponty, distinguish between skilled human performances and the instincts of animals on the basis of self-directed choice. Human acts are skilled because they can be part of a personally conceived goal-oriented set of activities, for which each act is chosen because of its appropriateness.

Our evaluation criteria, and the way in which we use the criteria to assess skill performance and development are on the next several pages. Keep in mind the importance of seeing any skill within its goal-oriented purpose and project.

THE CRITERIA OF COMPETENCY IN GOAL-DIRECTED ACTIVITY

A. THE MEASUREMENT PRINCIPLES

1. PURPOSIVENESS

   a. Clarity (in concept, statement, and definition)
   b. Coherence (in rationale)

2. PERFORMANCE

   a. Adequacy (thoroughness and sufficiency of activity)
   b. Accuracy (correctness and fidelity)

3. SELF-DIRECTEDNESS

   a. Economy
   b. Originality
   c. Suitability (to purpose)

B. THE RANGE OF QUALITY (1-4) IN EACH MEASUREMENT PRINCIPLE

An operational definition of each measurement principle will be made on a four point continuum that allows a judge of the activity to determine superior, satisfactory, and inadequate performance.

The numbers refer to distinct qualities which an operational definition specify.

The judge will locate characteristics in setting up the schema which are grouped as (4 - good), (3 - satisfactory), (2 - improvement needed), and (1 - inadequate given task, tutorial intervention required).

C. LONG-RANGE MEASUREMENT OF COMPETENCY DEVELOPMENT

Competency education seeks to help the individual develop skills that can be recognized as increasing in effectiveness and efficiency. As the individual becomes self-initiating and self-directed in his own use of skills, consistently in an organized, correct manner, we can state that he has mastered the skill.

Below is a five level measurement system for tracking the development of competencies from their first exercise through their mastery.

1. ABILITY TO REACT IN RESPONSE TO A STIMULUS

1.1 Openness/Mobilization

The measure is psycho-physical adjustment.

1.2 Performance

The measure is the adequacy and accuracy of response.

2. ABILITY TO PURPOSIVELY SHAPE ACTION IN RESPONSE TO A STIMULUS

2.1 Purposiveness

The measure is clarity and coherence of rationale.

2.2 Performance

The measure is the adequacy and accuracy of response.

3. ABILITY TO REDIRECT ACTION TOWARD NEW STIMULUS

3.1 Purposiveness

3.2 Performance

3.3 Self-directedness

The measure is the economy, originality, and suitability of the alternative selected.

4. ABILITY TO ORGANIZE ACTION TOWARD STIMULUS OF CHOICE CONSISTENTLY

4.1 Consistency of Purpose

The measure is fidelity to purpose and plan.

4.2 Consistency of Performance

The measure is the adequacy and accuracy of skilled action given the purpose and plan.

4.3 Consistency of Self-directedness

The measure is consistent economy, originality, and suitability of skilled action on one coherent project.

5. MASTERY DEMONSTRATION OF ISOLATED SKILLS

5.1 Exemplary use of discrete skill in performance

The measure is a mastery criteria of skill exercise based on a normed population.

5.2 Evidence of increased adequacy and accuracy in performance of a discrete skill.

D. NOMINATIVE DEFINITIONS OF MEASUREMENT PRINCIPLES

1. PURPOSIVENESS

a. The clarity of concept, definition, or statement is the quality of word selection and complete thought used to state idea.

(For example, in academic research, it includes the formulation of clear questions or propositions to guide research; the formulation of operational definitions, etc.)

b. The coherence in rationale is the logical appropriateness of the proposition, question, or statement in the context of the problem or issue under consideration.

(For example, in academic research, it includes the designation of behavioral indicators that can guide the collection of evidence; the appositeness of a hypothesis, given the original claim, etc.)

2. PERFORMANCE

a. The adequacy of performance is the fulfillment of necessary steps to satisfy the goal with thoroughness in each step of the performance, and sufficient activity in the total scope of the project to realize the goal.

(For example, in academic research, an adequate performance would be one that completed the research design with quality results in each phase.)

b. The accuracy of performance is consideration of the errors of judgment and execution in each of the procedures, and estimation of judgment and execution of each step in light of the total plan.

(For example, in academic research, an accurate performance would be adherence to the total research design, and freedom from procedural errors in the carrying out of each step.)

3. SELF-DIRECTEDNESS

a. The economy in a selection of response, among alternatives, satisfies the purpose in the least complex way.

(For example, in academic research, the choice(s) evidence the minimum possible methods of inquiry to afford necessary and sufficient results.)

b. The originality shown in the selection of response, among alternatives, is evidenced by choices not formerly identified as possible ones for this purpose.

(For example, in academic research, methods of inquiry, and research settings are used not previously stressed as alternatives for the particular problem.)

c. The suitability of a response, selected from alternatives, is determined by its logical appropriateness to the terms of the problem.

(For example, in academic research, selection of inquiry methods and settings should offer promise of the kind of evidence needed for proof.)

WORK-SHEET QUESTIONS/ PRO-CEDURES	PURPOSIVENESS		SELF-DIRECTEDNESS			PERFORMANCE		SCORE	
	Clarity	Coherence	Originality	Economy	Suitability	Adequacy	Accuracy	AP	PP

KEY

4 - Good

3 - Satisfactory

2 - Improvement Needed

1 - Inadequate

NA - Not applicable Here

AP - Actual Points

PP - Possible Points

Application of the Evaluation Criteria

On the following pages, the evaluation criteria will be applied to a worksheet used in LBST 101 (Introduction to the Social Sciences) to help the student formulate a researchable question or claim.

Notice how the worksheets are designed to enable each part to be evaluated according to one or more of the seven criteria.

Also, note that the two criteria of performance are not used in this worksheet for it does not call upon actual inquiry activities by the student, only on cognitive planning.

Operational definitions for each of the five applicable criteria are given in the range of adequate to inadequate fulfillment. This complete set of definitions is made for each worksheet, so that the scorer can assess work exactly, and that other scorers can come to agreement about what is expected and what accord the work has with these expectations.

Reference to operational definitions, rather than the generic, "nominal" definitions of the criteria, allow exactitude that permits a claim of validity across a panel of judges.

There are twenty worksheets for the LBST 101 course presently. A teacher's handbook will contain the scoring criteria for each worksheet.

LBST 101 IDEAS AND RESEARCH NAME_____

Worksheet 2: Formulating an hypothesis and defining concepts

1. Write your hypothesis:

_____

_____

_____

2. Give names to the two concepts involved in your hypothesis:

Concept 1: _____

Concept 2: _____

3. Write nominal and operational definitions for each concept:

.....

Concept 1:

a - nominal:

b - operational:

.....

Concept 2:

c - nominal:

d - operational:

.....

4. Provide three (3) indicators for each concept:

	Concept 1	Concept 2
(1)		(4)
(2)		(5)
(3)		(6)

5. Number 1-6 on the reverse side. Next to each number write a short explanation of how and why each of your indicators reflects one of your two concepts. Each statement can begin "Indicator #1 can be used to measure Concept #1 because..."

E. EXAMPLE OF MEASURING GOAL-DIRECTED ACTIVITY IN ACADEMIC RESEARCH WITH THE AFOREMENTIONED MEASUREMENT PRINCIPLES:

A WORKSHEET USED FOR STATING A RESEARCHABLE QUESTION IN LBST 101: INTRODUCTION TO SOCIAL SCIENCE

APPROPRIATE MEASUREMENT PRINCIPLES FOR WORKSHEET

1. Purposiveness
   a. Clarity
   b. Coherence
2. Self-directedness
   a. Economy
   b. Originality
   c. Suitability
3. Performance is not applicable to this worksheet task.

OPERATIONAL DEFINITIONS OF QUALITY FOR MEASUREMENT PRINCIPLES

1. Purposiveness

   a. Clarity of concept, definition, statement

   (4) - The concept is stated in no more than three words; it suggests behavioral indicators; the nominal and operational definitions are clearly stated and sufficient in explanatory power.

   (3) - Errors in clarity and thoroughness of concept, definition, and statement occur, but the meanings are clear enough to allow correction of basic ideas presented.

   (2) - Some major conceptual or definitional element must be added in order to allow for further work.

   (1) - The response is inadequate to a degree which calls for tutorial intervention and drill...(in the formulation of questions, concepts, etc.).

   b. Coherence in rationale

   (4) - The meaning of the answer is logically related to the purpose of the question.

   (3) - The meaning of the answer is somewhat vague given the purpose of the question.

   (2) - The meaning of the answer is not directed to the question; a confusion of the question's purpose or meaning may be present in the student.

   (1) - The response is inadequate to a degree which calls for tutorial intervention concerning the nature of the project, its goals, methods, etc..

2. Self-directedness

a. Economy

(4) - The selection of response makes its point with a minimum of words, is not redundant, and is sufficient to satisfy the purpose.

(3) - The selection of response may be redundant, wordy, and incomplete, but it does point towards a satisfactory fulfillment of the purpose.

(2) - The response must be limited both in length and kind in order to make further work possible.

(1) - The response is inadequate to a degree which calls for tutorial intervention to help the practice of brevity and clarity in statement, and, in the critical thinking skills of inference and judgement.

b. Originality

(4) - The selection of response shows originality in the statement of ideas to be studied, and in the indicators which will allow collection of evidence to support claim or answer questions.

(3) - The selection of response reflects previous model answers given to class, but is adequate in light of question being asked.

(2) - The selection of response is stereotyped to a degree that reflects a lack of seriousness in the attempt to answer questions in an independent manner.

(1) - The response is inadequate to a degree which calls for tutorial intervention to help individual think of personally meaningful responses.

c. Suitability (to purpose)

(4) - The selection of response is appropriate for the nature of the question.

(3) - The selection of response is not exactly suited to the nature of the question, but it demonstrates an attempt to logically respond.

(2) - The selection of response is unsuitable to question posed in a degree that shows misunderstanding of the question.

c. Suitability (Cont'd.)

(1) - The response is inadequate to a degree which calls for tutorial intervention to review student's comprehension of project goals; also, to provide drill exercise in critical thinking skills of analogy, inference, and judgement.